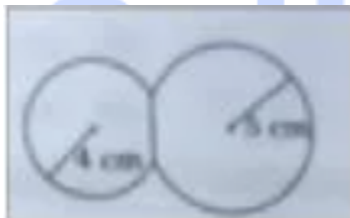


## TJEE (Tripura Joint Entrance Examination) 2022 Question Papers

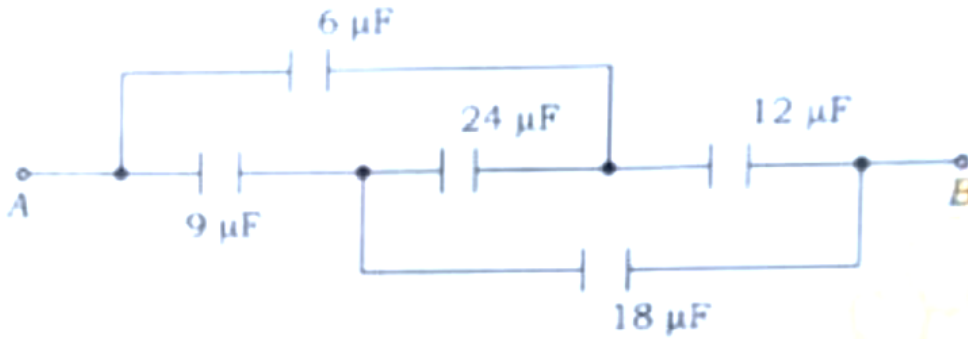
### TJEE 2022 Physics Question Paper

- Two uniform circular discs A and B have radii of 10 cm and 30 cm, respectively and have the same material and the same thickness. The ratio of their moment of inertia about their axes  $I_A/I_B$  will be
  - 1:81
  - 1:27
  - 1:9
  - 1:3
- The spring constant of a toy pistol is  $k$ . If the spring is compressed by a distance  $x$  and a bullet of mass  $m$  is thrown vertically upward, what will be the maximum height attained by the bullet?
  - $kx/mg$
  - $kx^2/mg$
  - $kx/2mg$
  - $2kx^2/mg$
- Two soap bubbles of radii 4 cm and 5 cm touch each other and produce a common surface as shown below. The radius of curvature of the common surface is



- 4-5 cm
  - 20/9 cm
  - 9 cm
  - 20 cm
- The rate of radiation of energy from a high-temperature black body at  $T$  K is  $E$  W/m<sup>2</sup>. What will be the rate of radiation, if temperature decreases to  $(2T/3)$  K?
    - $8E/27$
    - $16E/27$
    - $16E/81$
    - $32E/81$
  - When a bob is thrown from the earth's surface vertically upward with half the escape velocity. What will be the maximum height attained by this bob?

- $R/6$
  - $R/3$
  - $2R/3$
  - $R$
6. A bucket full of water is rotated in a vertical circular path of radius 1.6 m. For what expected maximum time period of revolution, water will not spill out from the bucket?
- 1.5 s
  - 2.5 s
  - 3.5 s
  - 4.5 s
7. Two gases having equal temperature  $T$ , equal pressure  $P$ , and equal volume  $V$  are mixed. If the temperature of the mixture is  $T$  and the volume is  $V$ , then its pressure will be
- $P$
  - $P/2$
  - $2P$
  - $4P$
8. The time period of oscillation of a simple pendulum in a stationary lift is 2 s. When the lift ascends with a constant acceleration of  $g/4$ , the time period of oscillation will become
- $2/\sqrt{5}$  s
  - $\sqrt{5}/2$  s
  - $4/\sqrt{5}$  s
  - $\sqrt{5}/4$  s
9. When a uniform electric field  $E$  is applied to an electron of charge  $-e$  and mass  $m_e$ , the magnitude of acceleration will be
- $mE/e$
  - $eE/m$
  - $e^2/m$
  - $em/E$
10. The velocity of a traveling wave of frequency 500 Hz is 360 m/s. The minimum distance between two points having a phase difference of  $60^\circ$  is
- 10 cm
  - 12 cm
  - 36 cm
  - 18 cm
11. The equivalent capacitance  $C_{AB}$  for the points A and B of the given combination of capacitance is



- $10 \mu\text{F}$
- $12.5 \mu\text{F}$
- $15 \mu\text{F}$
- $32 \mu\text{F}$

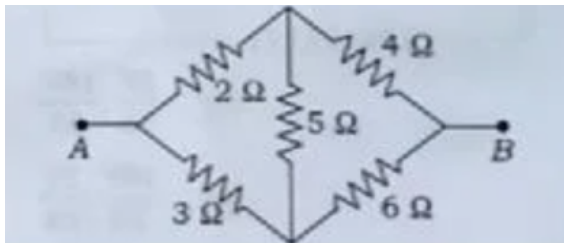
12. A charged particle having charges  $q$  and mass  $m$  moving at constant velocity  $V$  enters a transverse uniform magnetic field of strength  $B$ . It will move in a circular path of radius

- $mqB/v$
- $mq/Bv$
- $mv/Bq$
- $mB/wq$

13. A heater of  $9 \text{ ohm}$  resistance is connected to a  $30 \text{ V DC}$  supply for  $1 \text{ minute}$ . Energy produced by the heater is

- $100 \text{ J}$
- $270 \text{ J}$
- $600 \text{ J}$
- $6000 \text{ J}$

14. In the image below showcasing the given combination of resistances, the equivalent resistance  $R_{AB}$  between points  $A$  and  $B$  is

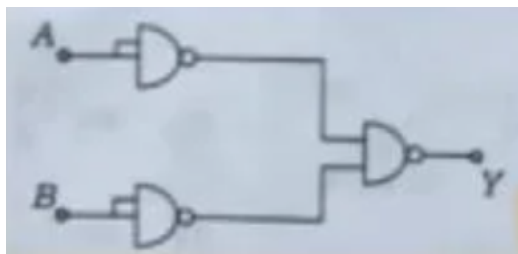


- $18/5 \text{ ohm}$
- $16/3 \text{ ohm}$
- $3 \text{ ohm}$
- $5 \text{ ohm}$

15. Two thin lenses of powers +12D and -2D, respectively, are kept side by side. The focal length of the combination is

- 10 cm
- 12 cm
- 14 cm
- 20 cm

16. The equivalent logic gate of the given logic circuit is



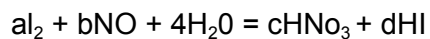
- NOR
- OR
- AND
- NAND

17. The wavelength of a photon emitted by a hydrogen atom when an electron makes a transition from  $n = 2$  to  $n = 1$  orbital is

- 121.8 nm
- 194.8 nm
- 490.7 nm
- 913.3 nm

### TJEE 2022 Chemistry Question Paper

1. Balance the following redox reaction.



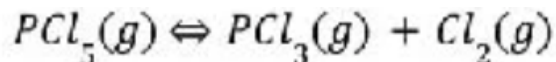
- 3,2,2,6
- 6,2,3,2
- 2,6,3,2
- 3,6,2,2

2. If a small amount of In (metal) is added to Ge - crystal, then the composite will turn into which one of the following substances?

- Insulator
- P-type semiconductor

- n-type semiconductor
- Rectifier

3. Take into consideration, the following reversible reaction. Which of the below-listed factors will increase the rate of the forward reaction?



- Inert gas is introduced at a constant volume
  - Chlorine gas is passed at a constant volume
  - By reducing the volume of the reaction vessel
  - Inert gas is introduced at constant pressure
4. At 0°C, a balloon is expanded with an ideal gas up to 490 ml which is the 7/8th of its maximum expansion volume. If the temperature is being gradually raised, predict at what temperature it will burst
- 29° C
  - 30° C
  - 39° C
  - 312° C
5. Work done by 1 mol of an ideal gas for its adiabatic reversible change when temperature attains  $T_2$  from  $T_1$  is
- $(C_p - C_v) (T_2 - T_1)$
  - $C_p (T_2 - T_1)$
  - $C_v (T_2 - T_1)$
  - $(C_p - C_v) (T_1 + T_2)$
6. Increasing the order of the bond angle of the compounds  $NH_3$ ,  $BF_3$ ,  $H_2O$ , and  $CH_4$  obeys which one of the following series?
- $H_2O < NH_3 < CH_4 < BF_3$
  - $H_2O < CH_4 < NH_3 < BF_3$
  - $CH_4 < NH_3 < H_2O < BF_3$
  - $CH_4 < BF_3 < NH_3 < H_2O$
7. Proper decreasing order of the first ionization potential of the elements Be, B, C, and Li will be which one of the following?
- $C > B > Be > Li$
  - $C > Be > B > Li$
  - $B > C > Be > Li$
  - $Be > Li > B > C$
8. Mention the name of the pentose sugar present in RNA.
- 2 deoxyribose
  - Glucose

- Ribose
  - Fructose
9. 0.79 gm of a metal oxide is obtained from 0.5 gm of the same metal upon oxidation. The equivalent weight of the metal will be which of the following?
- 10
  - 3.8
  - 20
  - 40
10. Which set of the quantum is not possible?
- 3,2,-2,½
  - 3,2,-3,½
  - 4,0,0,½
  - 5,3,0,½
11. Which of the below-listed acids requires a foreign acid catalyst during esterification with ethanol?
- Oxalic acid
  - Benzoic acid
  - Acetic acid
  - Formic acid
12. If one or more odd electrons is/are present in a complex compound, then it is designated as
- Diamagnetic
  - Ferromagnetic
  - Ferrimagnetic
  - Paramagnetic
13. Mention the name of the minerals that do not contain Al (metals).
- Cryolite
  - Mica
  - Fluorspar
  - Feldspar
14. The chemical structure/composition of gangue being generated in the smelting process during Cu(metal) extraction is
- $\text{Cu}_2\text{O} + \text{FeS}$
  - $\text{FeSiO}_3$
  - $\text{CuFeS}_2$
  - $\text{Cu}_2\text{S} + \text{FeO}$
15. Which of the below-listed acids contains P-O-P bond?

- Hypophosphorous acid
- Phosphorous acid
- Pyrophosphoric acid
- Orthophosphoric acid

16. If an electrolyte solution has specific resistance  $x$  and  $y$  is the molarity of that solution, then the molar conductance ( $\lambda_m$ ) of that solution will be

- $100y/x$
- $1000x/y$
- $1000/xy$
- $xy/1000$

17. Which of the below-listed compounds is the hardest material?

- $\text{Be}_2\text{C}$
- $\text{SiC}$
- $\text{B}_4\text{C}$
- Graphite

